

Key outcomes and results from the ITU Focus Group on metaverse

Shin-Gak Kang
Chair, ITU Focus Group on metaverse

13 June 2024



ITU Focus Group on metaverse (FG-MV)

Unanimously established
by TSAG in Dec. 2022



ITU FG-MV Meetings



500+

Experts involved



Riyadh (ARB Region)
Shanghai (AP Region)
Geneva (EUR Region)
Queretaro (AMS Region)

155

WGs/TGs (e)-meetings



ITU-T FG-MV Deliverables



50+

Deliverables published
including a definition of
metaverse



Introduction

Graphic

to interact

2nd ITU Forum "Creating a metaverse for all
through international standards"

Playback 14,000 + Participation

☆ Collection



Hosting in the metaverse



4

Virtual exhibitions
and FG-MV
meetings held in
the metaverse



7th and final FG-MV meeting (12-13 June 2024, Geneva)



21

New Deliverables were
approved

52

Total Deliverables approved

**Diverse events on the
metaverse with
groundbreaking attendance**

5 Forums

in Saudi Arabia, China,
Tanzania, Mexico and
Geneva

17,000+

Participants in
attendance

8 Webinars

Dedicated to the topic of
metaverse on the Digital
Transformation Dialogues

2 Special Sessions

in Arusha and Riga
with call to actions

FG-MV Management Team

Government, Industry,
Academia, UN agencies, Asia,
Africa, Europe, Americas

Chairman

Shin-Gak Kang
(ETRI, Rep. of Korea)

Vice-Chairmen

Andrey Perez
(Brazil)

Hideo Imanaka
(NICT, Japan)

Per Fröjdh
(Ericsson, Sweden)

Shane He
(Nokia, Finland)

Vincent Affleck
(United Kingdom)

Yuntao Wang
(China)

**Leonidas
Anthopoulos**
(Greece)

Manuel Barreiro
(Aston Group,
Mexico)

Cristina Martinez
(European
Commission)

Stella Kipsaita
(Communications
Authority, Kenya)

Natalia Bayona
(UNWTO)

FG-MV Structure

A unique collaboration platform to shape an open, secure, and interoperable metaverse



WORKING GROUP 1

General



WORKING GROUP 2

Applications
& Services



WORKING GROUP 3

Architecture &
Infrastructure



WORKING GROUP 4

Virtual/Real World
Integration



WORKING GROUP 5

Interoperability



WORKING GROUP 6

Security, Data &
PII Protection



WORKING GROUP 7

Economic,
Regulatory &
Competition Aspects



WORKING GROUP 8

Sustainability,
Accessibility &
Inclusion



WORKING GROUP 9

Collaboration

Journey of FG-MV and related events



First meeting & 1st ITU Forum “Embracing the metaverse”

8-9 March 2023,
Riyadh, Saudi Arabia



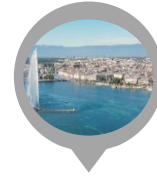
Second meeting & 2nd ITU Forum “Creating a metaverse for all through int. standards”

4-6 July 2023,
Shanghai, China



Special session & 3rd ITU Forum “Cities and the metaverse: Shaping a citiverse for all”

12-13 September 2023,
Arusha, Tanzania



Third meeting

2-5 October 2023,
Geneva, Switzerland



Special Session to promote FG-MV standardization activities

18 October 2023,
Riga, Latvia



Fourth Meeting

4-7 December 2023,
Geneva, Switzerland



Fifth meeting & 4th Forum “Shaping the Citiverse: People-centered cities & virtual worlds”

4-8 March 2024,
Queretaro, Mexico



Sixth meeting

30 April 2024,
Virtual



Seventh meeting & 5th Forum “Integrating virtual and physical worlds in the metaverse with digital twin” & UN Virtual Worlds Day

12-14 June 2024,
Geneva, Switzerland



ITU-T TSAG meeting

29 July - 2 Aug. 2024,
Geneva, Switzerland

FG-MV Definition of metaverse

The metaverse is...

“

An integrative ecosystem of virtual worlds offering immersive experiences to users, that modify pre-existing and create new value from economic, environmental, social and cultural perspectives.

NOTE – A metaverse can be virtual, augmented, representative of, or associated with the physical world.

ITU Focus Group on metaverse





Working Group 1: General

Terms of reference:

- Business ecosystem
- Collection of best practices, including a gap analysis
- Roadmap for setting technical standards
- Overall concepts, service model, related technologies of metaverse platforms and services
- Issues outside the scope of other WGs

3 Task Groups

- Terminology & definitions
- Implications for people in the metaverse
- Pre-standardization for the CitiVerse



WG1 deliverables (10)

Type	Title of deliverable	Timeline
Technical Report	Exploring the metaverse: opportunities and challenges	July 2023
Technical Report	Metaverse: An analysis of definitions	October 2023
Technical Report	Principles for building concepts and definitions related to metaverse	December 2023
Technical Specification	Definition of metaverse	December 2023
Technical Report	Near-term and long-term Implications for people in the metaverse	March 2024
Technical Report	A framework for confidence in the metaverse	March 2024
Technical Report	Overview of metaverse	June 2024
Technical Specification	Glossary for metaverse	June 2024
Technical Report	Definitions of CitiVerse	June 2024
Technical Report	Building a People-centred CitiVerse	June 2024



Working Group 2: Applications & Services

Terms of reference:

- Use cases for relevant applications and services required by interested parties in each domain, including vertical industries (e.g., Gaming and entertainment, remote work and collaboration, education and training, commerce, real estate, social interactions, health care, tourism, art and culture, etc.)
- High-level requirements for supporting related use cases for specific applications and services

6 Task Groups

- Generative Artificial Intelligence in the metaverse
- Metaverse tourism
- Industrial metaverse
- Medical metaverse
- Media coding
- Power metaverse



WG2 deliverables (8)

Type	Title of deliverable	Timeline
Technical Report	Power metaverse: Use cases relevant to grid side and user side	October 2023
Technical Specification	Capabilities and requirements of Generative Artificial Intelligence in metaverse applications and services	December 2023
Technical Report	Guidelines for metaverse application in power system	March 2024
Technical Report	Overview of the application requirements of metaverse on emergency management in chemical industrial parks	April 2024
Technical Report	The future of travel in the metaverse: landscape and use cases	June 2024
Technical Report	Landscape and use cases for the Industrial metaverse	June 2024
Technical Specification	Framework and requirements for the construction of human-driven 3D digital human application system for metaverse	June 2024
Technical Specification	Use case and requirements for virtual and real fusion coding in metaverse application	June 2024



Working Group 3: Architecture & Infrastructure

Terms of reference:

- Infrastructure-related issues including use cases, requirements, technical solutions, capabilities for supporting of metaverse platforms and services (e.g., Cloud and edge computing infra, networking infra, blockchain infra, etc.)
- Architectures, their functionalities, interfaces, intelligent management mechanisms, connectivity technologies, APIs, and QoS/QoE, performance, minimum requirements for infrastructure requirements, etc.



WG3 deliverables (3)

Type	Title of deliverable	Timeline
Technical Specification	<u>Requirements, functional framework and capability of IoT for metaverse</u>	April 2024
Technical Specification	Multimedia aspect of metaverse architecture	June 2024
Technical Specification	The reference framework of industrial metaverse	June 2024



Working Group 4: Virtual/Real World Integration

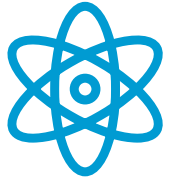
Terms of reference:

- Interoperable technologies, including use cases and requirements, to enable the integration of virtual world with real world, and to enable the convergence between virtual world and real world (e.g., Mechanisms for synchronization)
- Structured data models for virtual and real worlds mapping
- Applications and services integration between virtual and real worlds



WG4 deliverables (2)

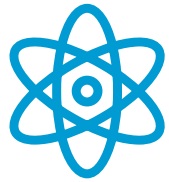
Type	Title of deliverable	Timeline
Technical Specification	<u>Requirements for the metaverse based on digital twins enabling integration of virtual and physical worlds</u>	March 2024
Technical Specification	<u>Reference model for the metaverse based on a digital twin enabling integration of virtual and physical worlds</u>	March 2024



Working Group 5: Interoperability

Terms of reference:

- Use cases and requirements for cross-platform interoperability
- Functional enablers for interoperability of services and applications
- Functional architecture and interfaces for cross-platform interoperability
- Interfaces amongst platform, users and devices



WG5 deliverables (3)

Type	Title of deliverable	Timeline
Technical Specification	<u>Service scenarios and high-level requirements for metaverse cross-platform interoperability</u>	March 2024
Technical Report	Interoperability of identity of things across metaverse platforms	June 2024
Technical Specification	High-level interoperability architecture for cross-platform metaverse	June 2024



Working Group 6: Security, Data & Personally identifiable information (PII) Protection

Terms of reference:

- Use cases and requirements related to security and PII protection aspects
- Security of networks and technology underpinning the metaverse platform, including cybersecurity and identity management
- Building confidence and security including PII protection-related aspects plus preventing online and offline harm and considering ethical issues and standards
- Consider the issues on trustworthiness related to the metaverse
- Child online protection
- Data ownership and protection
- Digital asset ownership

4 Task Groups

- cybersecurity
- building confidence and security in the metaverse
- child online protection
- issues on trustworthiness related to the metaverse



WG6 deliverables (9)

Type	Title of deliverable	Timeline
Technical Report	<u>Guidelines for consideration of ethical issues in standards that build confidence and security in the metaverse</u>	October 2023
Technical Report	<u>Cyber risks, threats, and harms in the metaverse</u>	December 2023
Technical Report	<u>Embedding safety standards and the user control of Personally Identifiable Information (PII) in the development of the metaverse</u>	December 2023
Technical Report	<u>Responsible use of AI for child protection in the metaverse</u>	December 2023
Technical Report	<u>Children age verification in the metaverse</u>	December 2023
Technical Report	<u>Considering online and offline implications in efforts to build confidence and security in the metaverse</u>	March 2024
Technical Report	Security for things across metaverses in aspects of data processing and management	June 2024
Technical Report	Challenges to achieving trustworthy metaverse	June 2024
Technical Report	The essential components of trusted data use in building a trustworthy metaverse	June 2024



Working Group 7: Economic, Regulatory & Competition Aspects

Terms of reference:

- Economic aspects and competition
- Metaverse value chain: main agents' role and interactions
- Impacts on revenues and investments, with a focus on the telecom sector
- Main competitive dynamics: scale and scope economies
- Metaverse potential market failures and regulatory remedies
- Public sector value models



WG7 deliverables (3)

Type	Title of deliverable	Timeline
Technical Report	<u>Policy and regulation challenges of the metaverse</u>	October 2023
Technical Report	<u>Regulatory and economic aspects in the metaverse: Data protection-related</u>	December 2023
Technical Report	Economic Value Creation and Competition in metaverse	June 2024



Working Group 8: Sustainability, Accessibility & Inclusion

Terms of reference:

- Impact on the climate changes (e.g., Green and low carbon issues, etc.)
- Environmental Sustainability related issues
- Accessibility related issues
- Social considerations
- Diversity, equity and inclusion
- Circular economy related issues

4 Task Groups

- sustainability
- sustainable metaverse design
- accessibility & inclusion
- metaverse social safety



WG8 deliverables (12)

Type	Title of deliverable	Timeline
Technical Report	Guidelines to assess inclusion and accessibility in metaverse standards development	October 2023
Technical Specification	Requirements of accessible products and services in the metaverse: Part I – System design perspective	October 2023
Technical Specification	Requirements of accessible products and services in the metaverse: Part II – User perspective	October 2023
Technical Specification	Design criteria and technical requirements for sustainable metaverse ecosystems	October 2023
Technical Specification	Accessibility requirements for metaverse services supporting IoT	December 2023
Technical Report	Guidelines and requirements on interpreting in the metaverse	December 2023
Technical Report	Accessibility for a sustainable metaverse	December 2023
Technical Report	Guidance on how to build a metaverse for all: Part I – Legal framework	December 2023
Technical Specification	Requirements for communication between human-avatar languages in the metaverse	March 2024
Technical Report	Metaverse Sustainability: Driving energy efficiency and GHG emissions reduction	June 2024
Technical Specification	Methodology on assessment of GHG emissions of metaverse	June 2024
Technical Report	Guidance on how to build a metaverse for all: Part II - Survey	June 2024



Working Group 9: Collaboration

Terms of reference:

- Promote more active collaboration with other SDOs by setting up a close liaison relationship, including the appointment of an FG-MV liaison rapporteur to other relevant SDOs
- Focal point on collaboration issues, including coordination of incoming and outgoing Liaison Statements in FG-MV
- Develop deliverable on gap analysis, in collaboration with other SDOs
- Develop deliverable on standardization roadmap on metaverse, in collaboration with other SDOs
- Other collaboration-related issues of FG-MV

Task Group

- Gap analysis



WG9 deliverables

Type	Title of deliverable	Timeline
Technical Report	Standardization roadmap for metaverse	June 2024
Technical Report	Metaverse standardization landscape for gap analyses	June 2024

FG-MV concluded.
But the work will not stop here...

Moving forward



UN Virtual Worlds Day

*Harnessing the metaverse
to advance the Sustainable
Development Goals*

14 June 2024
Geneva, Switzerland



itu.int/metaverse/un-virtual-worlds-day



Supported by:



In partnership with:



Organized by:



| ITU activities on metaverse: www.itu.int/metaverse

Award ceremony of UN Metaverse Think-a-Thon as part of the UN Virtual Worlds Day

UN Metaverse Think-a-Thon 2024

Virtual worlds
revolutionizing
smart sustainable
cities & communities



Supported by:



Co-organized by:



169 young talents
from **20+** countries;
69 solutions;
3 round competitions
in **1** month

**The metaverse continues to evolve
and the key is standardization.**

**Are you ready to join the future
metaverse worlds?**



Email

virtualworlds@itu.int



Website

www.itu.int/metaverse